

REMARKS

This amendment responds to an Office Action dated January 30, 2003, in the above-identified patent application. Claims 1-20 were filed in the original application.

By this response, Applicant has amended claims 1, 9, 10, 13 and 17, and has added new claim 21. Claims 1-21 are under consideration in the application, of which claims 1, 10, 17 and 21 are in independent form. This Response is being filed within four months of the Office Action outstanding. A Request for a One Month Time Extension, so as to extend the time for response to May 30, 2003, is submitted herewith. Applicant requests that the fees for the one month time extension and for the one additional independent claim be withdrawn from Applicant's deposit account no. 19-1457.

In the Office Action dated January 30, 2003, the Examiner rejects claims 10-12 and 14 under 35 USC 102(e) as allegedly being anticipated by King et al. (hereinafter "King"). In rejecting in the claims the Examiner states: "King et al. discloses a polarized light beam splitter assembly . . . including an embedded wire grid polarizer (See 26 in Figure 3; Figure 2) having a wire grid in communication with an internal air gap (See spaces between 34 in Figure 2 when the structure in Figure 2 is incorporated as 26 in Figure 3)."

In contrast, Applicant teaches a wire grid polarizer having an air gap 40 between each of the individual wires of the wire grid polarizer 28 and having an air gap 40 between the raised surface of the wire grid 28 and the second half 16 of prism 12 (shown in Figure 3 of Applicant's specification as filed). In other words, wire grid 28 does not contact second half 16 of prism 12 of the polarized beam splitter. In order to more clearly recite that the raised surface of Applicant's wire grid, and not just the spaces between the individual wires, are in communication with the air gap, Applicant has amended independent claim 10 to recite: "a polarized light beam splitter including an embedded wire grid polarizer having a wire grid including a raised surface, wherein said raised surface is in communication with an internal air gap." Support for this amendment to claim 10 is found in Applicant's Figure 3 as filed, wherein the surface of the wire grid that is raised outwardly from first half 14 of prism 12 is in contact with air gap 40 and is not in contact with second section 16 of prism 12.

Applicant believes that independent claim 10 as amended, as corresponding dependent claims 11-12 and 14, are not taught or suggested by the cited prior art and Applicant respectfully requests the Examiner to withdraw the rejection of claims 10-12 and 14 under 35 USC 102(e).

In the Office Action dated January 30, 2003, the Examiner rejects claims 1-9, 13 and 17-20 under 35 USC 103(a) as allegedly being unpatentable over King et al. or Perkins et al. (hereinafter "Perkins") in view

of Matsuda and Yamada et al. (hereinafter "Yamada"). Applicant respectfully disagrees.

Applicant's independent claim 1 as amended recites: "a polarized light beam splitter prism including a first internal exposed surface and a second internal exposed surface; and a wire grid polarizer including a first surface and a second surface . . . said first surface of said wire grid polarizer secured to said first internal exposed surface of said prism, and said second surface of said wire grid polarizer secured to said second internal exposed surface of said prism in said perimeter region so as to define a gap between said second surface of said wire grid polarizer and said second internal exposed surface of said prism in said central region such that said wire grid polarizer does not contact said second internal exposed surface of said prism in said central region." (emphasis added).

Applicant's independent claim 17 as amended recites: "an embedded wire grid polarizer including first and second surfaces, said embedded wire grid polarizer secured to said first section of said polarized light beam splitter at said first surface, and said embedded wire grid polarizer secured to said second section of said polarized light beam splitter only in an edge region of said second surface." (emphasis added).

In rejecting in the claims the Examiner states: "Both King et al. and Perkins et al. lack the wire grid polarizer being secured to an exposed internal surface of the beam splitter via a spacer so as to define a gap

between a surface of the wire grid polarizer and the exposed internal surface of the beam splitter prism." (emphasis added).

The Examiner goes on to state that Matsuda "teaches an apparatus utilizing an embedded wire grid polarizer (See for example Figure 8), wherein the wire grid polarizer (See 34A, 34B in Figure 8) is secured to an exposed internal surface of a substrate (See 31 in Figure 8) via a spacer or raised projection." The Examiner mischaracterizes Matsuda. Matsuda teaches polarizers 34A and 34B (Figure 8 of Matsuda) both secured to an external surface of a heat sink plate 32 (Figure 8 of Matsuda). As shown in Figures 6 and 8 of Matsuda, plate 32 is secured to a semiconductor substrate 36. Neither of polarizers 34A or 34B are positioned internally within either of heat sink plate 32 or semiconductor substrate 36. Neither heat sink plate 32 nor semiconductor substrate 36 comprise a polarized light beam splitter prism. Moreover, heat sink 32 and semiconductor substrate 36 together do not define two halves of a beam splitter prism. Accordingly, Matsuda does not teach or suggest a polarizer positioned between two halves of a polarized light beam splitter prism. Moreover, Matsuda teaches away from placing a wire grid polarizer between two halves of a polarized light beam splitter prism because the polarizers of Matsuda are not positioned within the light path of Matsuda. In particular, the light of Matsuda, designated as LRO and LR-1 in Figure 8, is reflected internally within plate 32 such that polarizers 34A and 34B are not positioned internally within the plate or within the path of light.

Applicant believes the Examiner has cited Matsuda merely because Matsuda appears to teach an air gap between polarizers 34A and 34B and semiconductor substrate 36 (Figures 6 and 8 of Matsuda). However, the air gap between polarizers 34A and 34B and semiconductor substrate 36 of Matsuda is not positioned internally within a beam splitter prism. Moreover, polarizers 34A and 34B of Matsuda are not even positioned on a beam splitter at all. Placement of polarizers 34A and 34B of Matsuda on the external surface of heat sink 32, outside of the internal light path "L" within heat sink 32, does not accomplish the purpose of Applicant's invention, namely, providing an air gap internally within a beam splitter prism such that the wire grid polarizer will function properly ("operation of the wire grid requires air on the metal side of the grid," Applicant's specification, page 2, line 12), and providing an air gap so as to avoid "reduced PBS [polarized light beam splitter] performance by evanescent coupling of the light waves from one prism block section to another." (Applicant's specification, page 7, lines 4-6). One looking to solve these problems in either King or Perkins would not look to the Matsuda reference. The Examiner is improperly using hindsight to combine the Matsuda reference with King and Perkins.

Yamada et al. does not even address polarized light beam splitter prisms or wire grid polarizers positioned internally therein.

As stated by the Examiner, neither King nor Perkins teach a "wire grid polarizer being secured to an exposed internal surface of the beam splitter via a spacer so as to define a gap between a surface of the wire grid

polarizer and the exposed internal surface of the beam splitter prism." (emphasis added). One skilled in the art would not look to Matsuda, which teaches a polarizer secured to the external surface of a heat sink plate, to modify the teachings of King or Perkins. Yamada does not even address beam splitter prisms or wire grid polarizers. For these reasons Applicant believes independent claims 1 and 17, and corresponding dependent claims 2-9 and 18-20, are not taught or suggested by King, Perkins, Matsuda or Yamada, either alone or in combination, and Applicant respectfully requests allowance of the same.

Applicant's claim 13 is dependent on claim 10 discussed above. For the reasons discussed above with respect to the King, Perkins, Matsuda and Yamada references, Applicant believes that independent claim 10 is not taught or suggested by the cited references and Applicant respectfully requests allowance of dependent claim 13.

In the Office Action dated January 30, 2003, the Examiner rejects claims 15 and 16 under 35 USC 103(a) as allegedly being unpatentable over King. Applicant respectfully disagrees.

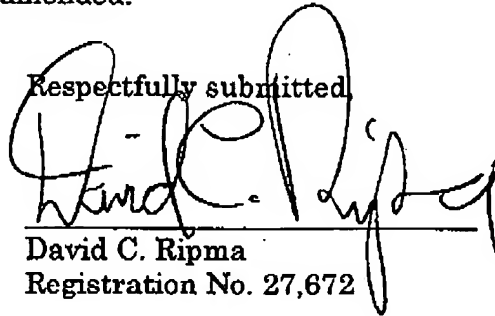
Claims 15 and 16 are dependent on independent claim 10. Claim 10 as amended recites: "a polarized light beam splitter including an embedded wire grid polarizer having a wire grid including a raised surface, wherein said raised surface is in communication with an internal air gap." King does not teach or suggest a raised surface of a wire grid polarizer being in communication with an internal air gap of the polarized light beam

splitter. Accordingly, Applicant believes claims 15 and 16 are not taught or suggested by King and Applicant respectfully requests allowance of the same.

By this response Applicant has added new independent claim 21. Applicant believes claim 21 is not taught or suggested by the cited prior art and Applicant respectfully requests examination of the same.

Applicant respectfully requests entry of this Amendment and reconsideration of the application as amended.

Respectfully submitted,



Date: May 30, 2003

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Appendix A

The present pages 12-14 of the present Response
indicate the changes to the claims made herein in
application Serial Number 10/021,988, filed
December 13, 2001

Deleted material is indicated in brackets [] and added material is shown
underlined.

1. (First Amended) A polarized light beam splitter assembly
comprising:

a polarized light beam splitter prism including a first internal exposed
surface and a second internal exposed surface; and

a wire grid polarizer including a first surface and a second surface
including a perimeter region and a central region, said first surface of said
wire grid polarizer secured to said first internal exposed surface of said
prism, and said second surface of said wire grid polarizer secured to said
second internal exposed surface of said prism in said perimeter region so as
to define a gap between said second surface of said wire grid polarizer and
said second internal exposed surface of said prism in said central region such
that said wire grid polarizer does not contact said second internal exposed
surface of said prism in said central region.

9. (First Amended) The assembly of claim 1 wherein said second surface of said wire grid polarizer includes a wire grid thereon such that said wire grid is in communication with said gap and such that said wire grid does not contact said second internal exposed surface of said prism in said central region.

10. (First Amended) A polarized light beam splitter assembly comprising:

a polarized light beam splitter including an embedded wire grid polarizer having a wire grid including a raised surface, wherein said raised surface is in communication with an internal air gap;

a light source positioned to emit light to said polarized light beam splitter; and

a reflection device positioned to receive light redirected by said polarized light beam splitter.

13. (First Amended) The assembly of claim 10 wherein said polarized light beam splitter defines first and second sections, said embedded wire grid polarizer is secured to said first section, and said embedded wire grid polarizer is secured to said second section only in a perimeter region thereof by adhesive having spacers distributed therein, wherein said spacers define a width of said internal air gap.

17. (First Amended) A polarized light beam splitter system comprising:

a polarized light beam splitter including first and second sections;

an embedded wire grid polarizer including first and second surfaces, said embedded wire grid polarizer secured to said first section of said polarized light beam splitter at said first surface, and said embedded wire grid polarizer secured to said second section of said polarized light beam splitter only in an edge region of said second surface; and

at least one spacer positioned between said second section of said polarized light beam splitter and said second surface of said embedded wire grid polarizer in said edge region.

21. (Newly Added) A polarized light beam splitter device comprising:

a polarized light beam splitter including first and second sections that define an air gap therebetween; and

an embedded wire grid polarizer secured to said first section and within said air gap such that said wire grid polarizer is not in contact with said second section.

Appendix B

Pages 15-19 of the present Response
indicate the Full Set of Pending Claims currently pending in
application Serial Number 10/021,988, filed
December 31, 2001

1. (First Amended) A polarized light beam splitter assembly
comprising:

a polarized light beam splitter prism including a first internal exposed
surface and a second internal exposed surface; and

a wire grid polarizer including a first surface and a second surface
including a perimeter region and a central region, said first surface of said
wire grid polarizer secured to said first internal exposed surface of said
prism, and said second surface of said wire grid polarizer secured to said
second internal exposed surface of said prism in said perimeter region so as
to define a gap between said second surface of said wire grid polarizer and
said second internal exposed surface of said prism in said central region such
that said wire grid polarizer does not contact said second internal exposed
surface of said prism in said central region.

2. The assembly of claim 1 further comprising spacers
positioned within said perimeter region, said spacers having a height that
defines a width of said gap.

3. The assembly of claim 2 wherein said second surface of
said wire grid polarizer is secured to said second internal exposed surface of

said prism in said perimeter region by an adhesive, and wherein said spacers are distributed within said adhesive.

4. The assembly of claim 2 wherein said spacers are formed on said second surface of said wire grid polarizer.

5. The assembly of claim 2 wherein said spacers each define a rigid sphere, and wherein said height of said spacers is equal to a diameter of said rigid spheres.

6. The assembly of claim 1 wherein said prism comprises a glass cube.

7. The assembly of claim 1 wherein said prism defines an elongate axis and wherein said first and second internal exposed surfaces are positioned at an angle in a range of one to eighty nine degrees with respect to said elongate axis.

8. The assembly of claim 7 wherein said first and second internal exposed surfaces are positioned at an angle in a range of forty to fifty degrees with respect to said elongate axis.

9. (First Amended) The assembly of claim 1 wherein said second surface of said wire grid polarizer includes a wire grid thereon such that said wire grid is in communication with said gap and such that said wire grid does not contact said second internal exposed surface of said prism in said central region.

10. (First Amended) A polarized light beam splitter assembly comprising:

a polarized light beam splitter including an embedded wire grid polarizer having a wire grid including a raised surface, wherein said raised surface is in communication with an internal air gap;

a light source positioned to emit light to said polarized light beam splitter; and

a reflection device positioned to receive light redirected by said polarized light beam splitter.

11. The assembly of claim 10 wherein said light source emits light having a predetermined orientation, and wherein said reflection device is chosen from the group consisting of a liquid crystal display panel and a mirror and a quarter wave plate.

12. The assembly of claim 10 wherein said polarized light beam splitter defines an elongate axis and wherein said internal air gap is positioned at an angle of approximately forty five degrees with respect to said elongate axis.

13. (First Amended) The assembly of claim 10 wherein said polarized light beam splitter defines first and second sections, said embedded wire grid polarizer is secured to said first section, and said embedded wire grid polarizer is secured to said second section only in a perimeter region thereof by adhesive having spacers distributed therein, wherein said spacers define a width of said internal air gap.

14. The assembly of claim 10 wherein said polarized light beam splitter comprises a glass prism.

15. The assembly of claim 10 wherein said air gap has a width in a range of one to thirty μm .

16. The assembly of claim 10 wherein said air gap has a width of approximately ten μm .

17. (First Amended) A polarized light beam splitter system comprising:

a polarized light beam splitter including first and second sections;

an embedded wire grid polarizer including first and second surfaces, said embedded wire grid polarizer secured to said first section of said polarized light beam splitter at said first surface, and said embedded wire grid polarizer secured to said second section of said polarized light beam splitter only in an edge region of said second surface; and

at least one spacer positioned between said second section of said polarized light beam splitter and said second surface of said embedded wire grid polarizer in said edge region.

18. The system of claim 17 wherein said spacer comprises a raised projection in said edge region of said second surface of said embedded wire grid polarizer.

19. The system of claim 17 comprising a plurality of spacers positioned between said second section of said polarized light beam splitter and said second surface of said embedded wire grid polarizer in said edge

region, wherein said spacers comprise rigid spheres having a predetermined diameter.

20. The system of claim 17 further comprising an air gap positioned between said second section of said polarized light beam splitter and a central region of said second surface of said embedded wire grid polarizer, wherein said wire grid polarizer includes a wire grid in communication with said air gap, and wherein said air gap has a uniform width across said air gap.

21. (Newly Added) A polarized light beam splitter device comprising:

a polarized light beam splitter including first and second sections that define an air gap therebetween; and

an embedded wire grid polarizer secured to said first section and within said air gap such that said wire grid polarizer is not in contact with said second section.

AMENDMENT TRANSMITTAL LETTER (Large Entity)

Applicant(s): James M. Florence

Docket No.
SLA0354

Serial No
10/021,988

Filing Date
December 13, 2001

Examiner
A. Lavarias

Group Art Unit
2872

Invention: Polarized Light Beam Splitter Assembly Including Embedded Wire Grid Polarizer

FAX RECEIVED

TO THE COMMISSIONER FOR PATENTS:

MAY 30 2003

Transmitted herewith is an amendment in the above identified application.

TECHNOLOGY CENTER 2800

The fee has been calculated and is transmitted as shown below.

CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER OF EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	21 -	20 =	1	x \$18.00	\$18.00
INDEP. CLAIMS	4 -	3 =	1	x \$84.00	\$84.00
Multiple Dependent Claims (check if applicable) _____					\$0.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$102.00

- ☒ Petition for Extension of Time Under 37 CFR 1.36(a) attached.
- ☐ No additional fee is required for amendment.
- ☒ Please charge Deposit Account No. 50-0803 in the amount of \$102.00.
A duplicate copy of this sheet is enclosed.
- ☐ A check in the amount of _____ to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 50-0803.
A duplicate copy of this sheet is enclosed.
- ☒ Any additional fees required under 37 C.F.R. 1.16.
- ☒ Any patent application processing fees under 37 C.F.R. 1.17.

David C. Ripma, Reg. No. 27,672

Dated: May 30, 2003

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office under 37 C.F.R. §1.8 at Fax No. (703) 872-9818 on May 30, 2003.

David C. Ripma, Reg. No. 27,672

Note: Each paper must have its own certificate or transmission, or this certificate must identify each submitted paper. The papers submitted include:

- | | |
|--|------------|
| <input checked="" type="checkbox"/> This Amendment Transmittal Letter (Include Duplicate) | 2 page(s) |
| <input checked="" type="checkbox"/> Response under 37 CFR § 1.111 | 19 page(s) |
| <input type="checkbox"/> Attachments | 0 page(s) |
| <input checked="" type="checkbox"/> Petition for Extension of Time under 37 C.F.R. § 1.136 (Include Duplicate) | 2 pages |

Total pages, including this Transmittal: 23

**PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)
(Large Entity)**Docket No.
SLA0354

In Re Application Of: James M. Florence

Serial No.
10/021,988Filing Date
December 13, 2001Examiner
A. LavariasGroup Art Unit
2872

Invention: Polarized Light Beam Splitter Assembly Including Embedded Wire Grid Polarizer

TO THE ASSISTANT COMMISSIONER FOR PATENTS:

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response to the Office Action of 01/30/03 above-identified application.
Date

The requested extension is as follows (check time period desired):

☒ One month ☐ Two months ☐ Three months ☐ Four months ☐ Five monthsfrom: 04/30/03
Dateuntil: 05/30/03
Date

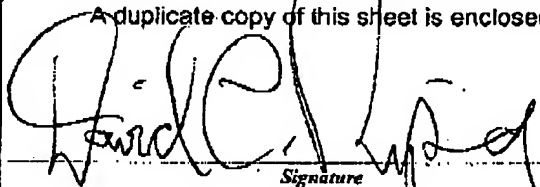
The fee for the extension of time is \$110 and is to be paid as follows:

☐ A check in the amount of the fee is enclosed.☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 50-0803

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A duplicate copy of this sheet is enclosed.


Signature

Dated: May 30, 2003

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CC:

I certify that this document and fee is being deposited on FAXED with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

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Typed or Printed Name of Person Mailing Correspondence

P12LARGE/REV08

**PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)
(Large Entity)**Docket No.
SLA0354

In Re Application Of: James M. Florence

Serial No.
10/021,988Filing Date
December 13, 2001Examiner
A. LavariasGroup Art Unit
2872

Invention: Polarized Light Beam Splitter Assembly Including Embedded Wire Grid Polarizer

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*Date*The fee for the extension of time is **\$110** and is to be paid as follows:

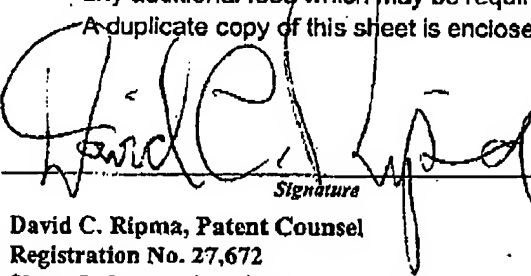
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MAY 30 2003

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Dated: May 30, 2003


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I certify that this document and fee is being deposited on **FAXED** with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

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